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Guitar Wiring - Modifications, Schematics. Installation of humbucker Pickups into a Fender Stratocaster.

NEW- Build a Quality Condenser Microphone !

Build a Quality Condenser Microphone ! Vintage Guitar Effects Schematic Archive

This page came about as an exercise for me to get an understanding of what can be acomplished by changing the pickups and a guitars wiring. I was trying to get away from the tinny twang of my standard strat and have done that... and more ! I now have three humbucking double coil pickups with switches so I can "split" the coils by grounding out one side and get a single coil sound. Also a big improvement is moving a tone control from the middle pickup to the bridge. The standard Strat does not have any tone control in the bridge position (which is too bright already). I have the tone controls in the bridge and neck positions and leave the middle without . I've tried wiring 2 pickups to one tone control but volume is effected between switch positions. I have also tried separate capacitors, but prefer one capacitor for both tone controls. Another mod I like is a bridge switch which engages the bridge pickup in any position. The web site links below have more detail and you should read them also before you start. The 500k ohm push/pull pots were distributed by All Parts #EP 286. ph. 281-391-0637

Many thanks to Seymour Duncan and Rodney Gene for their expertise and great pickups, and John S. Atchley for his great website and all responding to the guitar newsgroups ! (Links at bottom of page).

The Seymour Duncan Little 59ers are humbucking coils that replicate the '59 Les Paul pickups. They fit into a strats single coil space without needing to cut the guitar or pickguard. They have a wonderful depth of tonality - warmer that today's Les Pauls.

Strats original volume and tone potentiometers (pots) were 250k ohm... these are variable resistors. 500 k sounds better with humbucking coils. The new push pull pot (foreground) adds a switch without extra holes in the pickguard needed.

This 500k ohm push/pull potentiometer (pot) combines a volume/tone control with a double pole switch. The 6 switch terminals are like 2 separate switches with three terminals each. The center terminals are switched to one side or another.

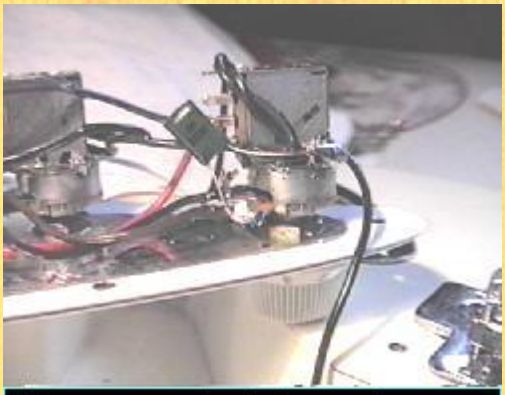
Here the 5-way selector has the neck and middle pickups selected. The bridge push/pull pot is raised- thus the bridge pickup is also engaged. So here I have all three humbucking pickups working.

Here all 3 push/pull pots are pulled up. The volume pot "splits" the neck and bridge pickups to single coil mode. The middle pot splits the middle pickup to single coil also. The bridge pot is engaged. Shown are all pickups engaged and split to single coil.

If you don't want to replace the strings just loosen them and hold them out of the way with a rag or sock. Loosen enough for the pickguard to clear. When putting back pickup wires will have to be nugged out t of the way some untill the guard will lie flat.

A low wattage pencil type soldering iron for this fine work. And use the narrow .032" 60/40 rosin core electrical solder.

The pickguard is positioned so you can work on it. I have left the wires to the output jack and ground attached to the guitar.



This green rectangle is a radio schack .022 microfarad film capacitor - (.022uf). It passes high frequencies to ground when the tone controls are turned. .047uf took too much. My tone controls are for neck and bridge. Stock Strat=none at bridge -too bright !

Wires are soldered to the pot casings in this manner. They are an electrical reference called "ground". Start by laying a wire on the side of the case.(this wire is attached to 2 center push/pull terminals to "split" 2 pickups to ground and thus single coils.

Next apply the solder tip to the joint and then a touch of solder. It is easier to do as much as you can before installing the pot to the pickguard. Jumper wires may help... also a surgical clamp or tweazers may help positioning things.

This volume pot sticks up to high... only a few threads should show past the washer and nut.

There is a second nut to set the height the pot protrudes from the pickguard.

Here is a side image of the 2 nuts holding the pot to the pickguard. One sets the height, the other tightens. Hold the pot from turning and use a wrech to make firm... but don't force anything.

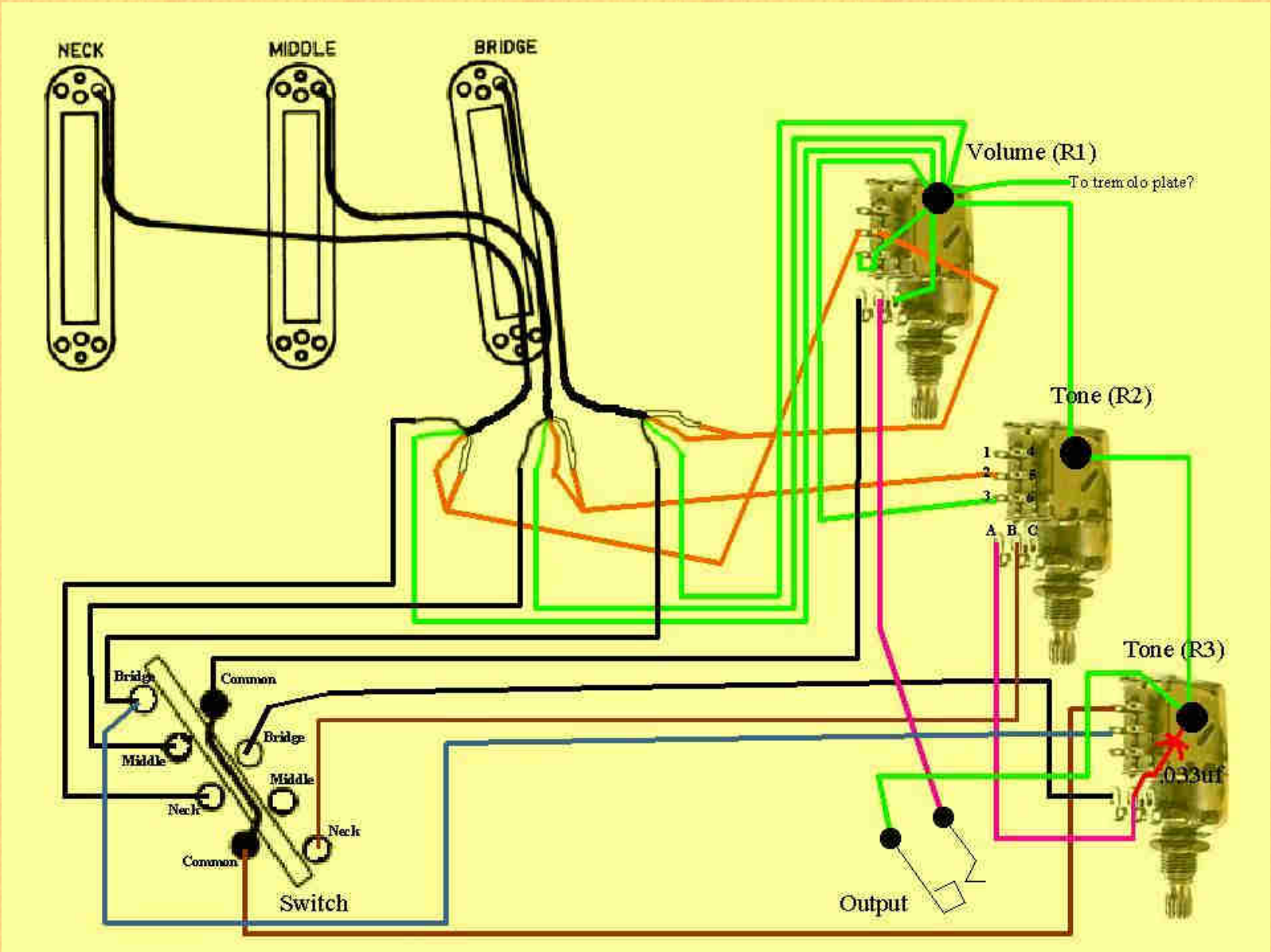
Here the pot is tightened at the right height. The knob presses on... it is possible to break the push/pull switch pulling the knob off... so get the height right before you press the knobs on... a few threads over the nut when tight.

This mess is a common ground after all of the green and ground coil wires have been attached and a wire connects each pot case together.

OK, I've taken my pickguard off enough times to strip the threads on one hole. Rather than use glue, a quick fix is to place a scrap of paper or steel wool in the hole to take up some room and allow the screw to grip.

Note that the 2 pickguard screws beside the bridge are longer than the others.

Pickup height is adjusted with 2 screws. Clockwise raises.
A set of auto feeler gauges or a sized drill bit can help-A nickel is about right thickness 1/16-1/8 or to taste . Press down strings at last fret and then set height.



Thank You Steve Glass for this detailed wiring diagram ! See Seymour Duncan's site for more diagrams.... Jim

Strat Original Potentiometers (pot=vol. and tone controls) were 250k-ohm. I purchased 250k ohm push/pull DPDT pots which include a DPDT Push/Pull switch... I later changed the vol. R1 to 500k as the sound was a little dark.. the 500k brightened things up... and a 1 Meg pot for R1 would be brighter still. R1 push/pull splits the bridge and neck pickups for non-humbucking single coil sound. R2 splits the middle pickup. R3 engages the bridge p/u in any selector switch position (neck and bridge or all three p/u's at once !). The tone capacitor is .033uF I won't try to explain much about the Strats 5-way selector swith. There are two sides separated by an electrical insulator. There is a common point and only three other terminals on each side of the switch. The 2 and #4 position are selected when metal on the rotary switch bridges 2 terminals. It will make sense when you get a look at it.

The wires here only describe electrical connections and how the circuits look electricaly. Each pickup has a shielded cable that carry the wires and keeps things tidy.
The red and white wires (A- and B+) are normally connected together from each pickup in humbucking mode and insulated. In this circuit a jumper is brought to R-1 from the neck and bridge pickups. When the Potetiometer switch is pulled the jumpers are grounded shorting out one of the two coils on both the bridge and neck pickups.... This is known as splitting. These should have similar characteristics to a Strats single coil configuration.

R3 has aPush/pull pot configured to connect the bridge pickup at any of the 5-way switches positions. This adds the ability to have both the Neck and Bridge pickup active at the same time. (Telecaster ?, Les Paul ?) .

The Tone controls have been moved to the bridge and neck and function in the #2 and #4 positions also. There is no tone control in this circuit for the center position #3 with the middle pickup used alone. I am going to leave this for a clean signal and may return to a single coil middle pickup If this proves to be too bright I could work with pickup height to get the desired output.

The Little '59ers By Seymour Duncan have a wonderful depth of tonality and a great improvement in sound. I have got away from the bright treble single coil sound and hear more overtones , musical color and depth. The '59 replicate the 1959 Les Paul patented pickups. Todays Les Pauls are much hotter- higher output than the warmer sound in 1959. When my Zoom GFX 707 guitar effects processor is used the sound can be a little too thick...

Pickup height ? Press the strings down on the last fret and measure the distance from the string to the pickups pole pieces. You might start a 1/16 at the bridge and 1/8" at the neck and bring things lower if too hot or bright. Some use a nickle or a drill bit or a nail as a feeler guage.The fender manual says at the low E string correct height is .024" for each pickup and .020" for the high E string. The Little 59er has pots which also individualy adjust if one string is louder than another.

Note: This information is provided for Your information. You should take your guitar to a reputable guitar shop if you are not comfortable with using a solder iron. Modifications to your guitar may void its warranty.
You can e-mail me with any questionsand I'll have more information after I've experimented some.

Your Friend, Jim

E-Mail Me

Links- These sites should help with any wiring problems and have some great diagrams !

http://guitarnuts.com **Many mods, a great site which explains things very well (like how the 5 way switch on a strat works) Graphics. Shielding and more !**

GuitarElectronics.com **Many diagrams and they sell parts !**

http://www.seymourduncan.com **You can email their helpful tech support**

Stewart Macdonalds **Luthier supplies, parts, books, kits, woods and great help. Ask for a catalog !**

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